







Bureau of Waste Management

Water Recycling / Oil & Gas Waste

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Bureau of Waste Management
January 15, 2015

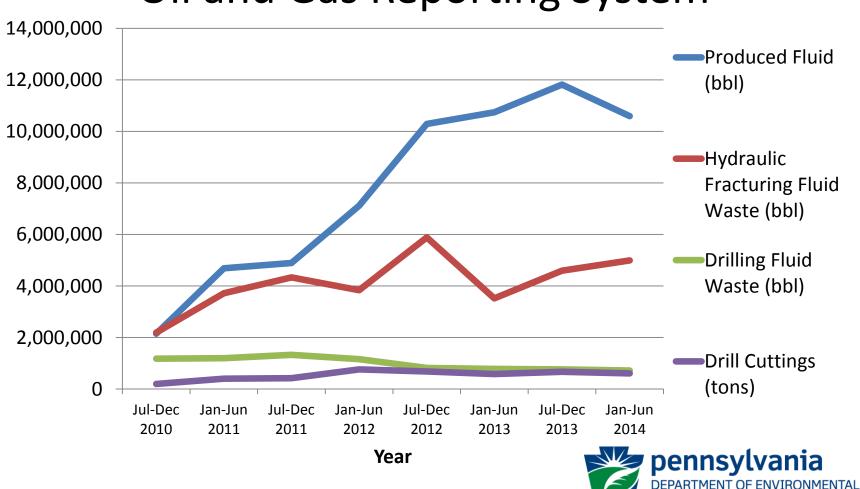
Overview

- Waste Generation
- PA Shale Wastewater Management
- Wastewater Management Options
- Regulatory Requirements for Wastewater Management Options
- Processing Wastewater for Beneficial Use
- Underground Injection
- Treatment Solids Disposal



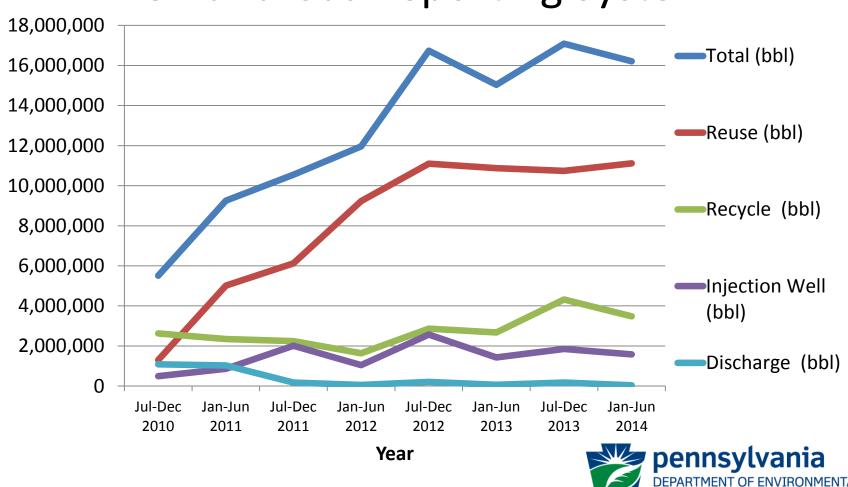
All Waste Generation

Oil and Gas Reporting System

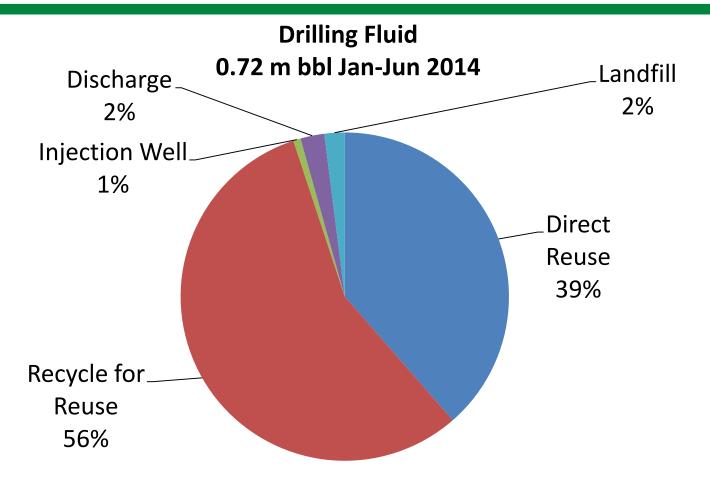


PROTECTION

Oil and Gas Reporting System

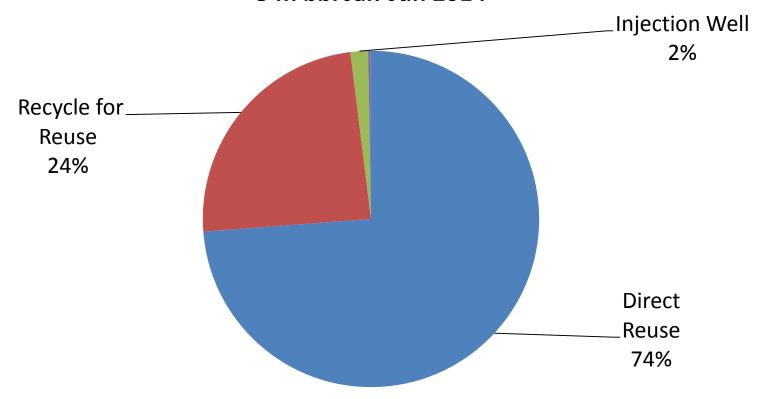


PROTECTION



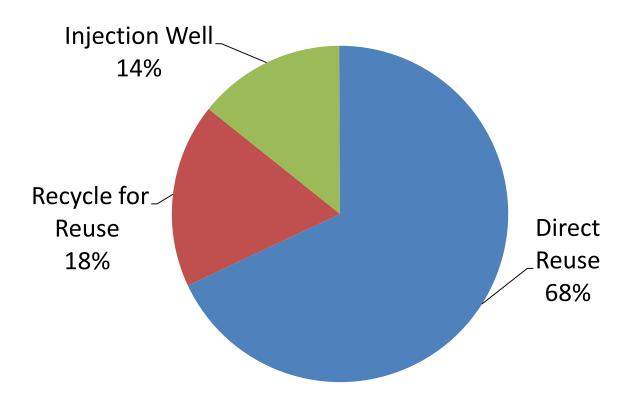


Hydraulic Fracturing Wastewater 5 m bbl Jan-Jun 2014





Produced Fluid 10.6 m bbl Jan-Jun 2014





Wastewater Management Options - Discharge

- On-Site/Off-site Treatment and Discharge
 - 2010 revised regulations required publicly owned treatment works and centralized waste treatment facilities to treat new or increased discharges of Total Dissolved Solids (TDS) to more stringent standards.
 - Practice of treatment and discharge of unconventional wastewater voluntarily discontinued in April of 2011.



Wastewater Management Options - Reuse

- Reuse without Processing
 - Permitted Well Site; or
 - Off-Site Permitted Well Site
 - Managed, transported and stored as a waste
 - If stored off the well site, considered to be a transfer station requiring a permit
- Since 2010, wastewater reuse has increased from 2.6 to over 22 million bbl/yr.



Wastewater Management Options - Recycling

- Processing Prior to Beneficial Use
 - On a permitted well site approved by the Oil and Gas Management Program
 - Managed, transported and stored as a waste
 - Off Well Site
 - GP 123
 - Individual waste permit
 - Managed, transported and stored as a waste
 - Since 2010, wastewater recycling has increased from 4.6 to over 7.8 million bbl/yr.



Processing Wastewater for Beneficial Use

General Permit WMGR123/Individual Permit:

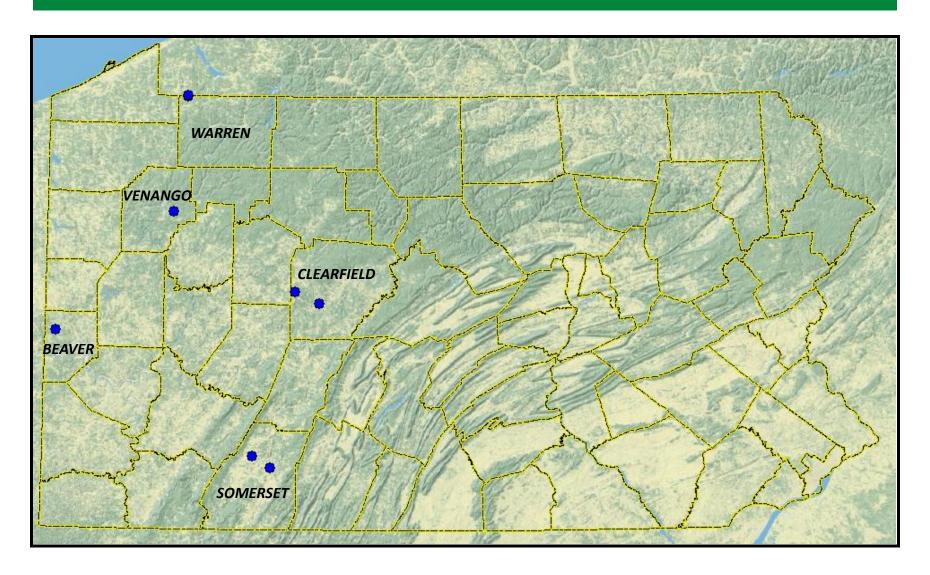
- Processing and beneficial use of processed liquid wastes generated by oil and gas well sites and associated infrastructure.
- Encourages the return of treated liquid waste to oil and gas well sites for reuse.
- Wastes include drilling fluid waste, hydraulic fracturing fluid waste and produced fluid.
- Minimizes water withdrawal and emission impacts on valuable water resources.
- Solids generated through treatment are processed for disposal in a landfill.

Underground Injection

- Administered by US EPA
- Eight permitted underground injection wells in Pennsylvania

API Number	County	Municipality
007-20027	Beaver	South Beaver
033-00053	Clearfield	Bell
033-22059	Clearfield	Ferguson
111-20006	Somerset	Jenner
111-20059	Somerset	Stoneycreek
121-44484	Venango	Cranberry
123-33914	Warren	Columbus
123-39874	Warren	Columbus
047-23835*	Elk	Highland
063-31807*	Indiana	Grant
* Change in use authorization has not yet been issued		

Underground Injection Wells



Treatment Solids Disposal

- Form U Disposal Approval for PA Landfills
 - Must meet Landfill Acceptance Criteria
 - Submitted to DEP Regional Offices
- In 2012, the total amount of solid waste generated by the oil and gas industry and disposed of in Pennsylvania landfills was 1.3 million tons.











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